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ABSTRACT

When watching video content, users often skip to specific moments within the video, rewatch specific parts, or navigate between sections of interest. Such actions are supported via user interface elements such as a scrubber bar with a scrubber knob that display the progress and current playback position within the video, respectively. This disclosure describes techniques for display of UI components and timed metadata related to the playback of video content. The UI helps viewers find and navigate to specific marked moments or sections of interest within a video. When a user scrubs a video using the scrubber bar or scrubber knob inside the start and end bounds of a segment, the corresponding chapter is highlighted within the scrubber bar by increasing the size and/or contrast of the segment and the knob within the bar. Increasing the size provides a zoomed-in view of the bar that makes it easier for a user to interact with the scrubber bar and knob to find the position of interest as well as to see smaller marker segments contained within a larger chapter segment. In addition, the UI includes annotations that provide relevant information, such as title of the segment, thumbnail and timestamp for the frame at the scrubber knob position, etc.

KEYWORDS

- Video segment
- Video chapter
- Segment marker
- Scrubber bar
- Scrubber knob
- Playhead
- Video section
- Video player user interface
- Video metadata
- Video highlights

BACKGROUND

When immersed in watching video content, users often skip to specific moments within the video, rewatch specific parts, or navigate between sections of interest. Users typically perform such actions using corresponding buttons or other elements within the user interface (UI) or scrubbing on a scrubber bar and/or scrubber knob that display the progress and current playback position within the video, respectively. To help users perform such actions as well as to provide relevant context, video content is often divided into relevant segments, such as chapters, scenes, etc., with specific frames within the video specifying the beginning and end of the segment. The beginning and end moments of each segment can be specified using individual timestamped frames within the video. Segment boundaries are shown visually on the scrubber bar, e.g., with thin vertical lines that indicate their start and end positions within the playback stream.

A video can contain a single set of chapters. Chapters within a video are a set of non-overlapping segments such that the entirety of the video is covered by the set of chapters. For example, a video depicting a sporting event can be divided into chapters for each quarter, while an instructional video can be divided into chapters corresponding to each of the steps for performing the action being taught.

Markers are segments indicating interesting sections within a video along with relevant metadata. For instance, markers can denote segments with content such as touchdowns in a video of a football game, use of a specific ingredient within a cooking video, etc. A marker can be contained fully within a single chapter, overlap exactly with a chapter, or span across multiple chapters. Further, markers can be grouped into relevant sets of similar markers based on themes or any other organizing feature of interest. For example, markers for touchdowns, field goals,

and safeties within a video of a football game can be grouped into a set that identifies all scoring events within the game. A given video can contain many different sets of markers.

In contrast to chapters, the set of all markers contained within a video can be overlapping and does not necessarily cover the entire length of the video. While chapters are a structural part of the video defined by specific start and end timestamps, markers are supplemental with a fuzzy duration specified by start and end points that are contextually dependent. Chapters are typically created and specified manually by the video creator. Markers can be similarly specified by video creators or can be generated automatically based on algorithmic processing of the audiovisual content within the video and/or user-permitted community input, such as comments, shares, etc. on a video hosted by an online platform.

DESCRIPTION

This disclosure describes techniques for display of UI components and timed metadata related to the playback of video content that is designed to help viewers find and navigate to specific marked moments or sections of interest within a video. The enhancements are based on segments, such as chapters and/or markers within video content.

Specifically, when a user scrubs a video using the scrubber bar or scrubber knob inside the start and end bounds of a segment, the corresponding chapter is highlighted within the scrubber bar by increasing the size and/or contrast of the segment and the knob within the bar. Increasing the size provides a zoomed-in view of the bar. The zoomed-in view makes it easier for a user to interact with the scrubber bar and knob to find the position of interest as well as to see smaller marker segments contained within a larger chapter segment. In addition, the UI includes annotations that provide relevant information, such as title of the segment, thumbnail and timestamp for the frame at the scrubber knob position, etc.

The user can tap the title of the segment within the annotated UI to bring up an engagement panel that displays the chapter list along with relevant chapter-related actions, such as share, save, repeat, etc. The share action results in sharing the chapter from its start location while the repeat action initiates playback of the chapter from the beginning. When in repeat mode, the scrubbing bar and knob for that section corresponding to the chapter are highlighted as described above. In addition, the UI can include appropriate visual indicators that the user is watching the segment in repeat mode and show the chapter title as an overlay when looping back to the beginning. The user can exit the repeat mode by scrubbing out of the repeating segment, tapping the repeat action again, or closing the engagement panel.

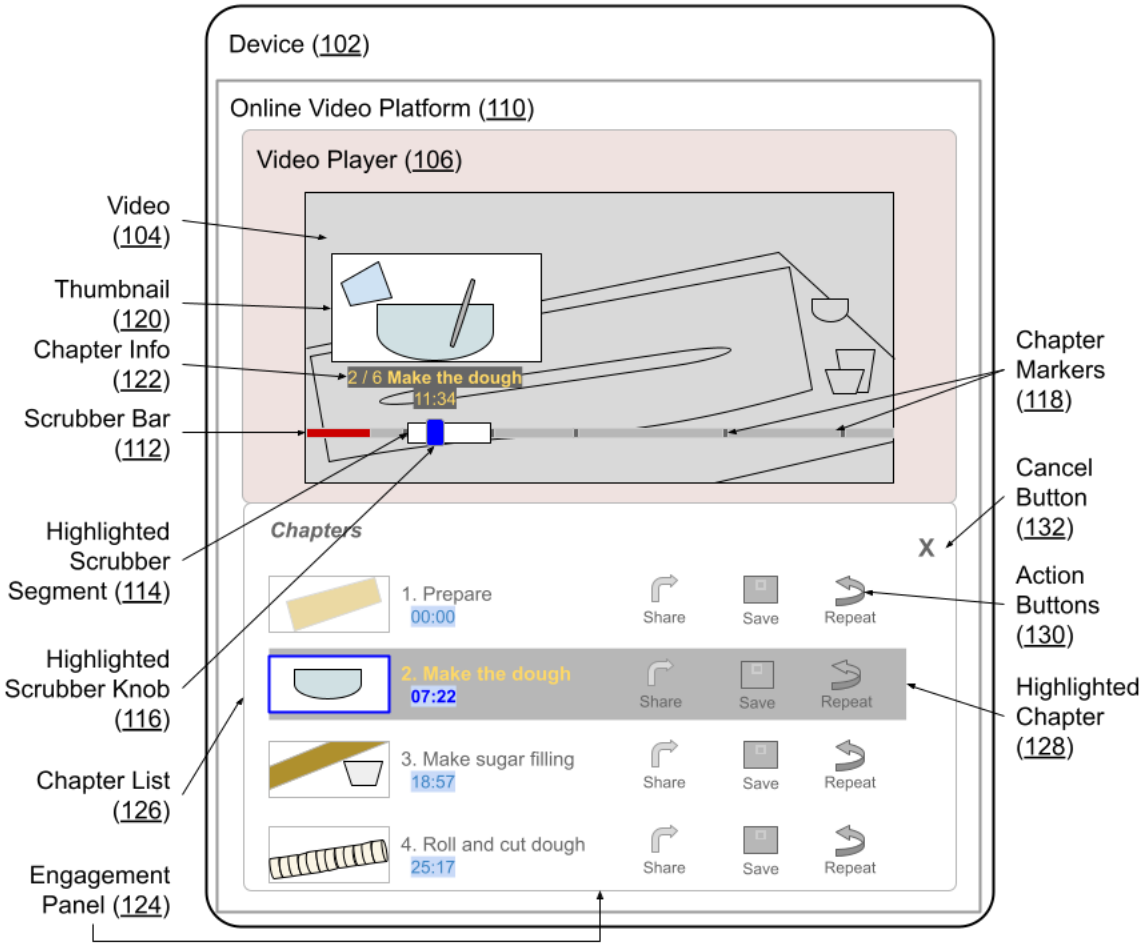

Fig. 1: Highlighting UI elements related to the video segment being scrubbed

Fig. 1 shows an example user interface of a video player that implements the techniques described in this disclosure. A user is using a device (102) to watch a video (104) with instructions for a baking recipe within the video player (106) provided by a video platform (110), e.g., via a web browser or dedicated application. The locations of chapter boundaries within the video are shown with chapter markers (118) within a scrubber bar (112).

While watching the video, the user wishes to skip ahead to a section of interest by searching for it by scrubbing within the video. The UI shows a larger and highlighted scrubber bar segment (114) in a different color and scrubber knob (116) to highlight the scrubber bar section for the chapter corresponding to the user scrubbing action. In addition, the video playback is paused and grayed out. The thumbnail (120) of the video frame at the highlighted scrubber knob position is overlaid on top along with information (122) for the corresponding video chapter. Further, the user interface optionally includes an engagement panel (124) with a chapter list (126) in which the chapter being scrubbed within the video player is highlighted (128). Each chapter entry within the list includes corresponding action buttons (130) for sharing, saving, or repeating the chapter. The user can tap the cancel button (132) to close the engagement panel.

If a marker segment is too short to be visible within the display resolution of the scrubber bar, only the relevant information is shown within the UI. In such cases, the non-displayed short segment is attached to the preceding or following displayable segment as appropriate. When users begin scrubbing within a threshold value of the start or end of a chapter, the scrubber knob is snapped to the corresponding chapter boundary. Users can optionally be provided haptic feedback as additional indication of the snapping navigation. Moreover, users can perform a relevant familiar action, such as tapping on the edges of the screen, to skip to chapters. Skipping

a chapter in such a manner can be shown visually with appropriate visual confirmation, such as fading in the information for the upcoming chapter.

In some cases, users can directly arrive at a specific segment within a video, e.g., through deep links from external sources such as search results, link sharing by other parties, etc. In such cases, users can initially be shown appropriate chapter information, such as title and number, as an overlay within the player. The chapter can be highlighted in the scrubber bar for a short interval after which the chapter plays as usual.

When a user enters the clip mode to mark a clip within the video content, display of the segment markers can be disabled until the user chooses to share the clip via the engagement panel or exits the clip mode and returns to viewing the underlying video. When a segment highlighted within the scrubber bar as described above includes advertising content, the indicator for the advertisement shown within the portion can be increased in size along with the corresponding section of the scrubber bar. If an advertisement is contained in a gap between two segments, the advertisement indicator can be increased in size to enlarge the gap to provide appropriate visual separation in the UI to avoid confusion between video and advertising content.

The user interface as described in this disclosure can be based on timed metadata obtained with permission from one or more relevant sources, such as information explicitly provided by video creators, user-generated content related to the video, algorithms that analyze video content, etc. The video creation and/or hosting platform that provides the video player can include functionality that enables video creators to provide extensive timed metadata to enable the user interface as described herein.

The enhanced user interface as described herein can be implemented within any application, device, or platform that supports creation, hosting, or playback of video content. The

various threshold and sizing parameters involved in the operation can be provided by the developers and/or specified by the users and/or determined dynamically at runtime. The user interface techniques described in this document provide mechanisms for searching and navigating within video content with improvements in the visibility, ease of use, and convenience, thus enhancing the user experience (UX) of interacting with video content.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs or features described herein may enable collection of user information (e.g., information about a user's videos, video annotations, a user's preferences, or a user's current location), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure describes techniques for display of UI components and timed metadata related to the playback of video content. The UI helps viewers find and navigate to specific marked moments or sections of interest within a video. When a user scrubs a video using the scrubber bar or scrubber knob inside the start and end bounds of a segment, the corresponding chapter is highlighted within the scrubber bar by increasing the size and/or contrast of the segment and the knob within the bar. Increasing the size provides a zoomed-in view of the bar

that makes it easier for a user to interact with the scrubber bar and knob to find the position of interest as well as to see smaller marker segments contained within a larger chapter segment. In addition, the UI includes annotations that provide relevant information, such as title of the segment, thumbnail and timestamp for the frame at the scrubber knob position, etc.

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